

Factoring by GCF, Grouping

$$21x + 14 = 7 \left( \frac{21x}{7} + \frac{14}{7} \right) = \boxed{7(3x + 2)}$$

GCF: 7

$$8x^4 + 14x^3 = 2x^3 \left( \frac{8x^4}{2x^3} + \frac{14x^3}{2x^3} \right) = \boxed{2x^3(4x + 7)}$$

GCF:  $2x^3$

$$9x^2 - 3x = 3x(3x - 1)$$

GCF:  $3x$

$$10xB - 25B = 5B \left( \frac{10xB}{5B} - \frac{25B}{5B} \right)$$

$$\text{GCF: } 5B = \boxed{5B(2x - 5)}$$

\* Capital and lowercase are different variables.

$$5x(y+9) - 3(y+9)$$

$$\text{GCF: } (y+9)$$

$$(y+9) \left( \frac{5x(y+9)}{\cancel{(y+9)}} - \frac{3(y+9)}{\cancel{(y+9)}} \right)$$

$$(y+9)(5x-3)$$

$$(5x-3)(y+9)$$

$$10x^3(a+2) + 4x^2(a+2)$$

$$(a+2)(10x^3 + 4x^2)$$

$$2x^2(a+2)(5x+2)$$

$$10x^3(a+2) + 4x^2(a+2)$$

$$\text{GCF: } 2x^2(a+2)$$

$$2x^2(a+2) \left( \frac{10x^3(a+2)}{\cancel{2x^2(a+2)}} + \frac{4x^2(a+2)}{\cancel{2x^2(a+2)}} \right)$$

$$2x^2(a+2)(5x+2)$$

$$-28AB + 12A - 35B + 15$$

$$(-28AB + 12A) + (-35B + 15)$$

$$-4(7B - 3) + (-5)(7B - 3)$$

$$\boxed{(7B - 3)(-4 - 5)}$$

$$-(7B - 3)(4A + 5)$$

$$(3 - 7B)(4A + 5)$$

$$28AB + 20A - 21B - 15$$

$$(28AB + 20A) + (-21B - 15)$$

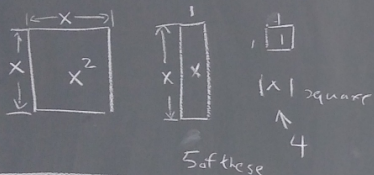
$$4A(7B + 5) + (-3)(7B + 5)$$

$$(4A - 3)(7B + 5)$$



## Factor trinomials

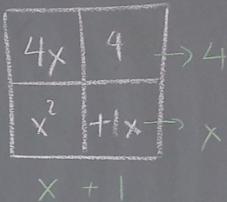
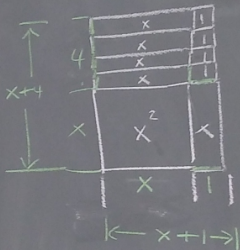
$$x^2 + 5x + 4$$



\* Area of rectangle:  $l \times w$

re allot the shapes to form a rectangle

$$x^2 + 5x + 4 = (x+4)(x+1)$$



$$x^2 + 5x + 4$$

Problem: how to  
convert.  $5x = 4x + 1x$

$$4 \cdot 1 = 4$$

$$4 + 1 = 5$$

Factor

Given:  $|x^2 + bx + c$

$$c = \frac{r_1 \cdot r_2}{\quad}$$

$$b = \frac{r_1 + r_2}{\quad}$$

$$(x+r_1)(x+r_2)$$

Factor  $x^2 + 5x + 4$

$$a = 1$$

$$b = 5 = \underline{4 + 1}$$

$$c = 4 = \underline{4 \cdot 1}$$

$$x^2 + 4x + 1x + 4$$

$$(x^2 + 4x) + (1x + 4)$$

$$x(x + 4) + 1(x + 4)$$

$$\boxed{(x + 1)(x + 4)}$$

Factor:  $x^2 - 12x + 35$

$$a = 1$$

$$b = -12 = \underline{-7 + -5}$$

$$c = 35 = \underline{-7 \cdot -5}$$

$$x^2 - 7x - 5x + 35$$

$$(x^2 - 7x) + (-5x + 35)$$

$$x(x - 7) + (-5)(x - 7)$$

$$\boxed{(x - 5)(x - 7)}$$

$$2x^2 + x - 10$$

$$\begin{array}{l} x \\ a=2 \\ b=1 \\ c=-10 \end{array} \rightarrow \begin{array}{l} ac = -20 = \underline{5} \cdot \underline{-4} \\ b = +1 = \underline{5} + \underline{-4} \end{array}$$

$$2x^2 + x - 10$$

$$2x^2 - 4x + 5x - 10$$

$$(2x^2 - 4x) + (5x - 10)$$

$$2x(x-2) + 5(x-2)$$

$$\boxed{(2x+5)(x-2)}$$

$$2x^2 + x - 10$$

$2x^2$	$-4x$	$\rightarrow$	$(2x)$
$+5x$	$-10$	$\rightarrow$	$+5$

$\downarrow$        $\downarrow$   
 $x$      $-2$

$$(2x+5)(x-2)$$

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